

Injection molded part

The invention relates to an injection molded part, in particular a toothbrush body, with a basic body 5 injection-molded from plastic, on the surface of which a decoration is two-dimensionally applied and is covered by an encapsulation of a plastic by a second injection-molding operation.

10 In the case of injection molded parts of this type, it is known to apply the decoration with its rear side to the surface of the basic body and subsequently encapsulate it with a clear transparent plastic. After 15 that, the decoration can be seen by an observer through the transparent encapsulation.

The high injection pressure and the high temperature of the plastic of the encapsulation may cause damage to the surface of the visible side of the decoration 20 during the injection-molding operation of the encapsulation.

The object of the invention is therefore to provide an injection molded part of the type stated at the 25 beginning, in the encapsulation of the basic body of which damage to the visible side of the decoration is at least largely avoided.

This object is achieved according to the invention by 30 the basic body consisting of a transparent and/or opaque and/or translucent plastic and the decoration being applied with its visible side to the surface of the basic body.

35 By this arrangement, the visible side of the decoration is covered by the basic body during the injection-molding operation of the encapsulation, and is consequently protected from damage. The rear side is

much less sensitive. Damage to it caused by the injection pressure and thermal loading has at least largely no influence on the visible side of the decoration, so that its decorative effect is not 5 impaired.

The plastic of the encapsulation may be non-transparent. It may, however, also be a transparent and/or opaque and/or translucent plastic.

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For simple and secure fastening of the encapsulation to the basic body, the encapsulation may cover one or more decoration-free regions of the basic body with material engagement, which is brought about by the superficial 15 melting of the plastic of the basic body during the encapsulating operation caused by the plastic of the encapsulation.

If the encapsulation covers the basic body without a 20 form fit, fastening of the encapsulation to the basic body takes place by the adhesion of the material engagement alone, which leads to greater freedom in the shaping of the injection molded part.

25 The plastics of the basic body and the encapsulation may have different degrees of hardness.

The decoration-free regions may be arranged in the edge 30 region of the decoration 4 for the material-engaging connection.

In order that the region of the decoration is 35 encapsulated in such a way that no contaminants can be drawn into gaps between the basic body and the encapsulation in this region, the encapsulation may extend over the basic body fully or partly beyond the edge region of the decoration.

Another possibility for the material-engaging connection is that the decoration-free regions are arranged in the region of the decoration, whereby a secure connection of the encapsulation to the basic 5 body can be achieved even in the case of decorations covering a large surface area.

If the connection between the basic body and the encapsulation is to be made even more secure, the basic 10 body may have in one or more of the decoration-free regions recesses which are open toward its surface and are filled by the plastic of the encapsulation, since the surface area of the encapsulated decoration-free regions is increased in this way.

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At the same time, the recess may represent one or more alphanumeric characters or symbols, such as for example a company logo.

20 The surface of the basic body bearing the decoration may be either planar or else convexly curved.

In order to avoid damage to the tools that are used for applying the decoration, for example when printing the decoration on by means of a pad stamp, the region of the surface of the basic body surrounding the decoration can be formed at a lower-lying level than the surface area covered by the decoration, which can be achieved in a simple way by the region of the 25 surface of the basic body surrounding the decoration being formed in a convexly rounded manner. In this 30 way, an enlargement of the decoration-free region which can be encapsulated is at the same time achieved.

35 The convex rounding may in this case extend into the outer edge region of the surface of the basic body bearing the decoration.

The decoration may be formed in a wide variety of ways. For instance, the decoration may be an insert part or a hot transfer film or a metallized film.

- 5 The decoration may also be applied to the surface of the basic body by printing, in particular by pad printing or screen printing or laser printing or inkjet printing.
- 10 To produce a complicated multilayered image, a further decoration may be applied to the encapsulation and be covered by a further encapsulation, which covers one or more regions of the first encapsulation that are free from the further decoration with material engagement
- 15 with respect to the first encapsulation.

It is also possible, however, that after each encapsulation a further decoration is applied spatially behind an already encapsulated decoration and is covered by a further encapsulation.

Exemplary embodiments of the invention are described in more detail below and are represented in the drawing, in which:

- 25 Figure 1 shows a cross section of a first exemplary embodiment of an injection molded part,
- 30 Figure 2 shows a cross section of a second exemplary embodiment of an injection molded part,
- Figure 3 shows a cross section of a third exemplary embodiment of an injection molded part.
- 35 The injection molded parts represented in the figures are toothbrush bodies. In principle, the subject matter of the invention can be used in the case of any type of injection molded part. So, the injection

molded parts may also be, for example, housings of electric razors, wet razors or housings of domestic appliances.

5 The injection molded parts represented have a basic body 1, which was produced in a first operation from a transparent plastic by injection molding. The upwardly directed surface 2 of the basic body 1 is convexly curved.

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Printed onto the surface 2 by pad printing is a decoration 4, the visible side 5 of which is directed toward the surface 2 of the basic body 1 and can be seen by an observer through the transparent basic body 15 1.

Since the surface area of the decoration 4 is smaller than the surface 2, a decoration-free edge region enclosing the decoration 4 is formed on the surface 2.

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For an encapsulating operation, the basic body 1 was placed into an overmolding tool, for which purpose the basic body 1 is provided at its peripheral side wall, enclosing the surface 2, with a peripheral shoulder 3 25 serving for acceptance in the overmolding tool.

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In the encapsulating operation, the basic body 1, the decoration 4 and the decoration-free edge region 6 have been provided with an encapsulation 7 in a covering manner. In Figure 2, this encapsulation 7 also covers over a further decoration-free region 8 within the region of the decoration 4. Where the encapsulation 7 covers the decoration-free edge region 6 and the decoration-free region 8, a material engagement between the materials of the basic body 1 and of the encapsulation 7 has been produced by the encapsulating operation and has the effect of connecting these two parts firmly to each other.

In the case of the exemplary embodiment of Figure 1, the encapsulation 7 is transparent and on it, over the decoration, a further decoration 4' has been applied by 5 pad printing with its visible side 5' directed toward the basic body 1 and covered in a further encapsulating operation by a further encapsulation 7'. This also involves the second decoration 4' being enclosed by a decoration-free edge region 6' of the first 10 encapsulation, the further encapsulation 7' also extending over the further edge region 6', so that the further encapsulation 7' is connected to the encapsulation 7 by material engagement of the materials of these two parts to each other.

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The further decoration 4' can also be seen by an observer through the transparent basic body 1 and the transparent encapsulation 7'.

20 In the case of the exemplary embodiments of Figures 1 and 2, the encapsulation 7 and 7' extends beyond edge regions 6 and 6', respectively, into the region of the side wall, while in the case of the exemplary embodiment of Figure 3 the encapsulation 7 covers only 25 the decoration 4 and the edge region 6 of the surface 2.